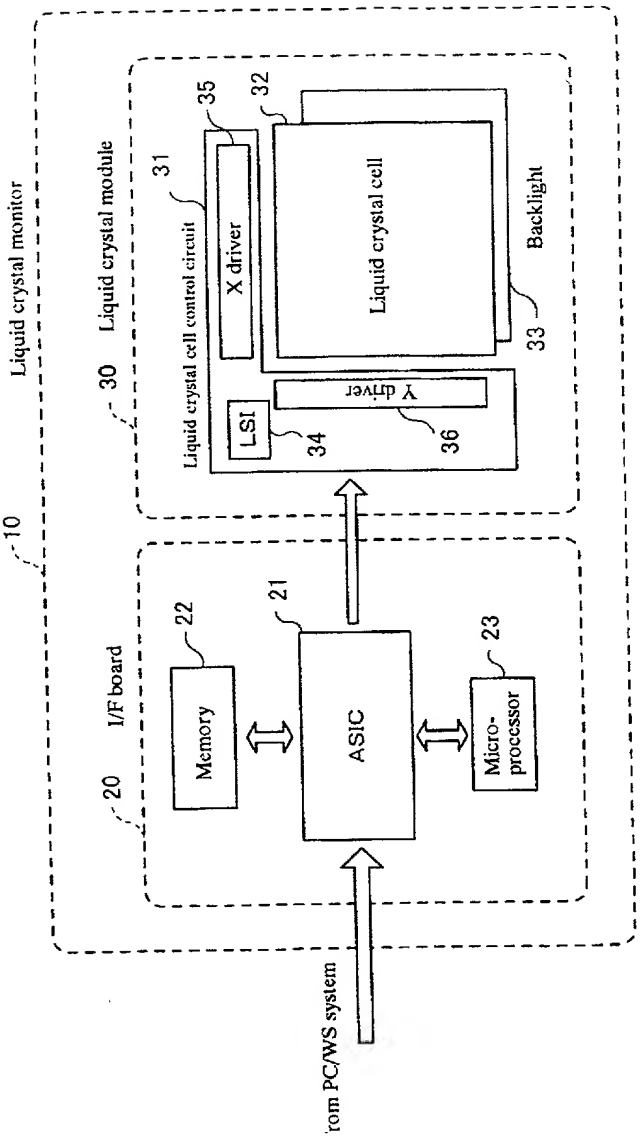
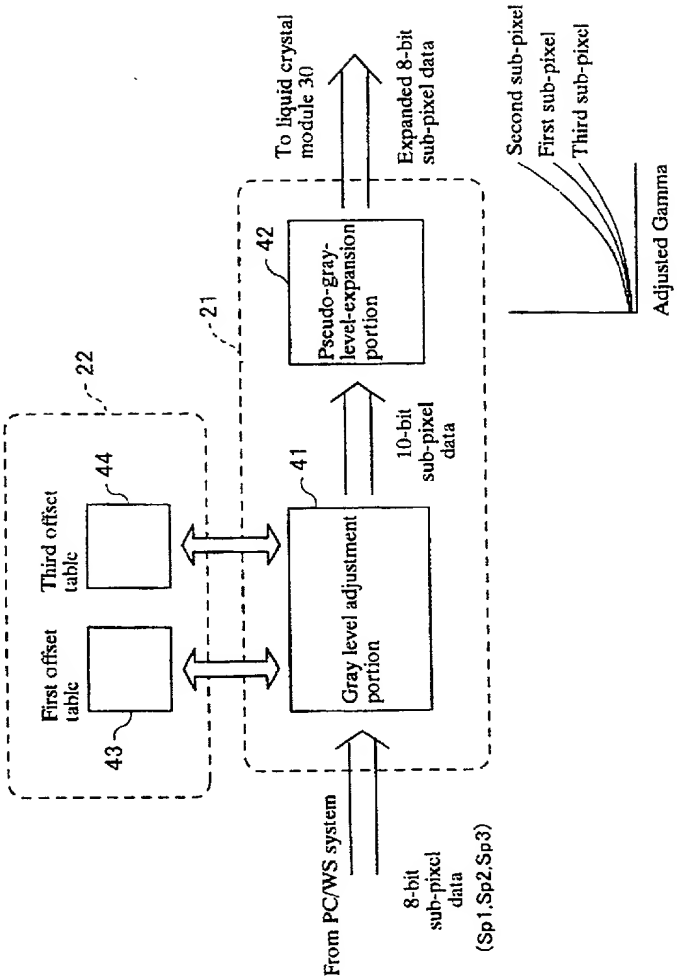
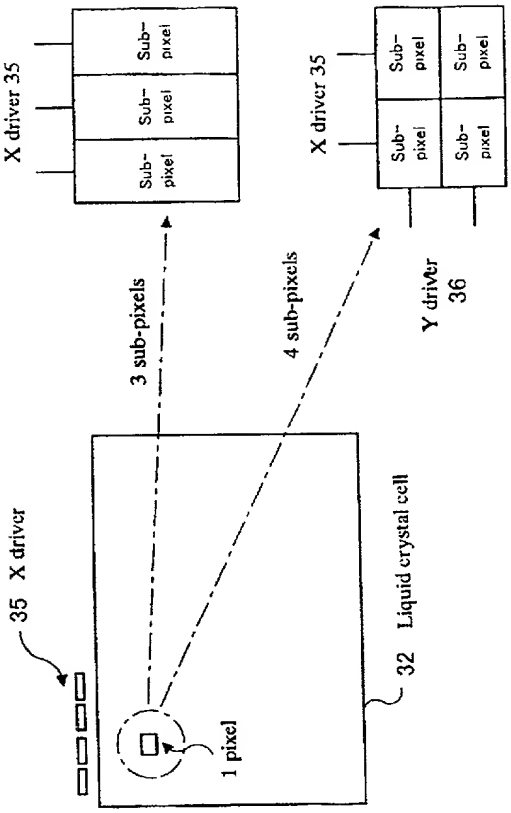
[Figure 1]


Liquid crystal monitor
10
Liquid crystal module
30
Liquid crystal cell control circuit
31
X driver
35
Liquid crystal cell
32
Backlight
33
LSI
34
Y driver
36
I/F board
20
Memory
22
ASIC
21
Micro-processor
23
rom PC/WS system


From PC/WS system
8-bit sub-pixel data (Sp1,Sp2,Sp3)
Gray level adjustment portion
41
10-bit sub-pixel data
Pseudo-gray-level-expansion portion
42
Expanded 8-bit sub-pixel data
To liquid crystal module 30
21
22
First offset table
43
Third offset table
44
Second sub-pixel
First sub-pixel
Third sub-pixel
Adjusted Gamma

[Figure 3]

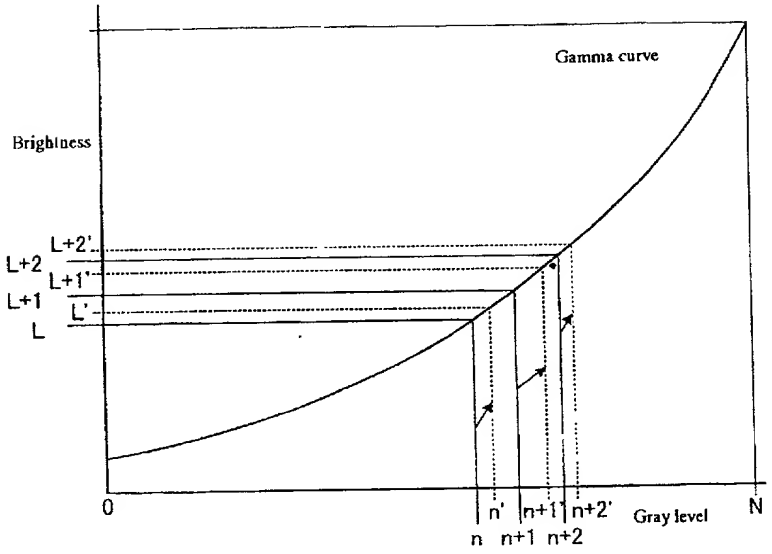

X driver 35
Sub-pixel
Sub-pixel
Sub-pixel
X driver 35
Sub-pixel
Sub-pixel
Sub-pixel
Sub-pixel
3 sub-pixels
4 sub-pixels
Y driver
36
35 X driver
1 pixel
32 Liquid crystal cell

[Figure 4]

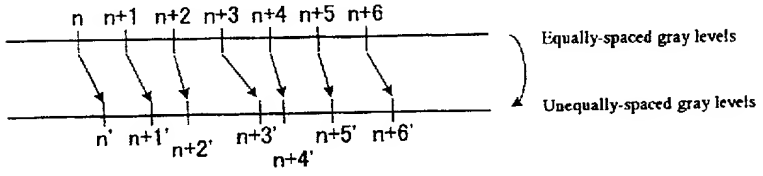
$$n\,(C_1 exp(\gamma_1 N) - 1) = C_k exp(\gamma_k x) - 1 \quad \cdots\cdots ①$$

$$x = \frac{1}{\gamma_k} ln\left(\frac{n\,C_1 exp(\gamma_1 N) - (n-1)}{C_k}\right) \quad \cdots\cdots ②$$

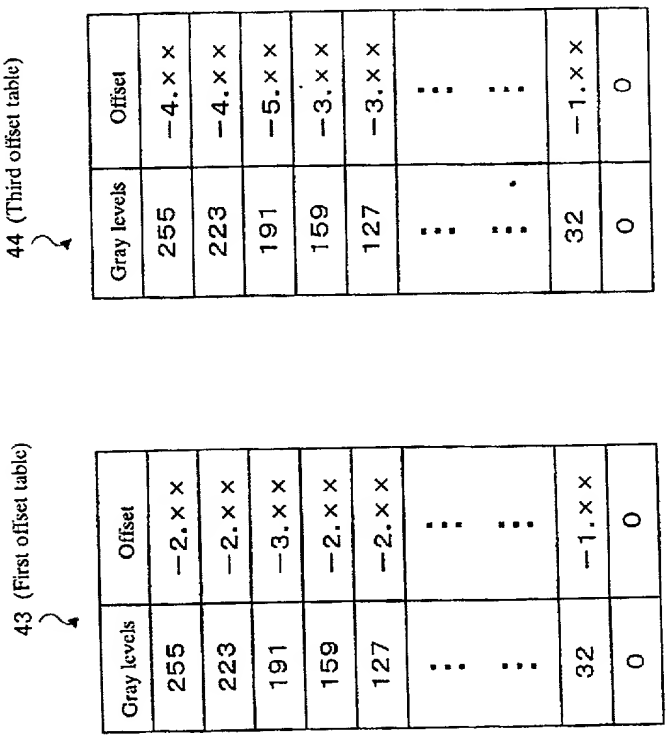
(a) Adjustment of gamma by converting gray level spacing



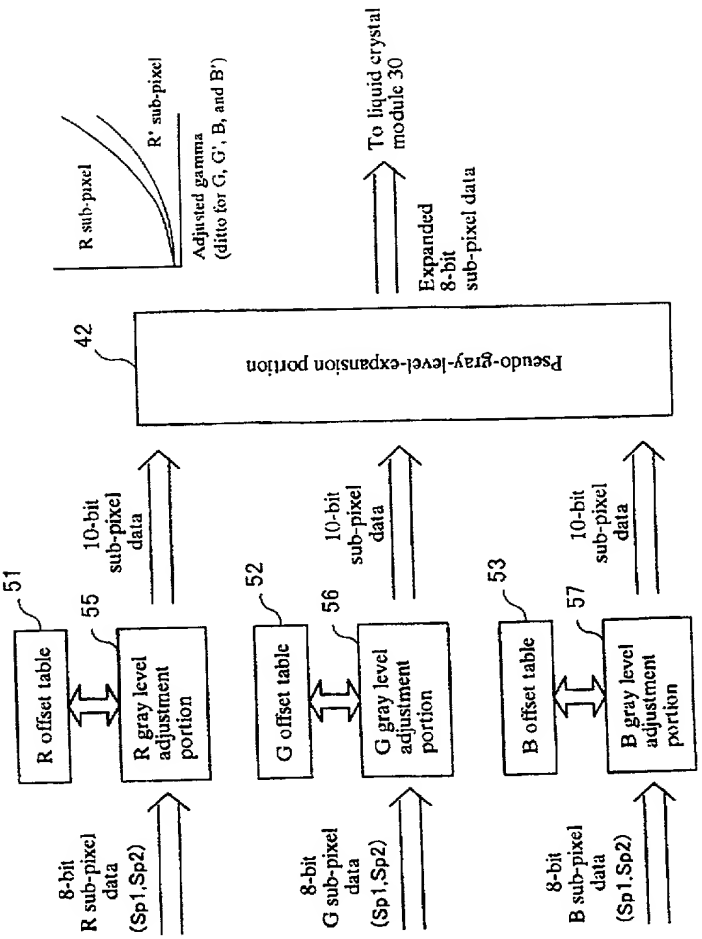
(b) Conversion of gray level spacing



[Figure 6]


44 (Third offset table)
Gray levels
Offset
255
−4.××
223
−4.××
191
−5.××
159
−3.××
127
−3.××
32
−1.××
0
0
43 (First offset table)
Gray levels
Offset
255
−2.××
223
−2.××
191
−3.××
159
−2.××
127
−2.××
32
−1.××
0
0

[Figure 7]


R sub-pixel
R' sub-pixel
Adjusted gamma
(ditto for G, G', B, and B')
To liquid crystal module 30
Expanded 8-bit sub-pixel data
42
Pseudo-gray-level-expansion portion
51
R offset table
55
R gray level adjustment portion
10-bit sub-pixel data
8-bit R sub-pixel data (Sp1,Sp2)
52
G offset table
56
G gray level adjustment portion
10-bit sub-pixel data
8-bit G sub-pixel data (Sp1,Sp2)
53
B offset table
57
B gray level adjustment portion
10-bit sub-pixel data
8-bit B sub-pixel data (Sp1,Sp2)